

"... three barleycorns,  
round and dry ..."

On Page 6

# Space News ROUNDUP!

MSC's 'fleet'  
and her crew—

On Page 3

VOL. 5, NO. 2

MANNED SPACECRAFT CENTER, HOUSTON, TEXAS

NOVEMBER 12, 1965

## Hilburn Speaker At Annual MSC Awards Ceremony

Earl D. Hilburn, NASA Deputy Associate Administrator, will be the keynote speaker at the Seventh Annual MSC Awards Ceremony November 18 in the MSC Auditorium.

The ceremony will begin at 2 p.m. with an invocation by Rev. Robert A. Engstrom,



Hilburn

pastor of the House of Prayer Lutheran Church, Clear Lake City. Master of Ceremonies Paul E. Purser, special assistant to the Director, and

H. Mervin Hughes, executive secretary of the MSC Awards Committee, will conduct the program.

MSC Director Dr. Robert Gilruth will present 30-year service awards prior to introducing the keynote speaker. Hilburn will make the presentation of invention awards.

Special Award winners will be recognized by Deputy Center Director George M. Low, and Dr. Gilruth will make a special presentation. Recipients of service awards will then be recognized by MSC Assistant Director for Administration Wesley H. Hjernevik.

A booklet containing pictures of awardees will be distributed at the ceremony.

## President Signs Bill For 3.6% Increase In Federal Salaries

On October 30, 1965, the President signed into law the Federal Employees Salary Act of 1965. The bill provides an across-the-board 3.6 per cent increase in salary for GS employees. The effective date of the increase for MSC employees was October 10, 1965. The new rates, along with retroactive pay since October 10, will be reflected in the pay check of November 12.

In addition to the pay increase, the bill provides for:

- Review of determinations that the work of an employee is not of an acceptable level of competence.

- Scheduling travel on official duty time to the maximum extent possible.

- Severance pay for employees involuntarily separated from the Service.

(See Table On Page 7)



WIRED FOR SOUND—Dr. Charles A. Berry uses a life-size mannikin to demonstrate to newsmen how biomedical sensors and other medical experiment devices will be attached to the Gemini VII crewmen.

## Flight Surgeon Berry Outlines Gemini VII Medical Experiments

Medical experimenters plan to take advantage of the 28 man/days of spaceflight exposure that will result from the 14-day Gemini VII mission, for all of the medical experiments developed for the Gemini program will be flown on that mission. Gemini VII will be the first mission in which all such experiments will be conducted.

In a briefing to newsmen on Gemini VII medical experiments November 1, Dr. Charles A. Berry, Chief of Center Medical Programs, described the experiments and their objectives. All words in quotes are those of Dr. Berry.

*M-1, Cardiovascular Reflex Conditioning*—This experiment uses inflatable thigh cuffs which are attached to the pilot and inflated periodically. "The purpose of this experiment is to try and determine whether this does give protection against this post-flight orthostatic hypotension by stimulating the reflexes that tend to return blood from the lower extremities."

*M-3, In-Flight Exerciser* — "provides us with a major workload for the heart to determine its response. On the four and eight day flights, we have seen no change in this response. The heart has been able to respond in the same manner and it has returned to normal within the same time periods at the end of

the mission as it did at the beginning of the mission. It will also be used for general exercise during the Gemini VII mission."

*M-4, In-Flight Phonocardiogram*—"will be used to compare the mechanical activity with the

(Continued on Page 2)

## Engine 'Backfire' May Have Caused Agena Failure

Findings of a joint NASA-Air Force-industry Agena Review Board indicate that the most probable cause of the failure of the Agena rendezvous vehicle launch for Gemini VI October 25 was a hard start of the primary propulsion system.

A hard start is analogous to the backfiring of a car engine, and could have induced a shock into the Agena airframe.

Following the hard start theory, tests are being conducted to determine whether the oxidizer/fuel feed sequences may have caused abnormally high back pressures in the Agena's engine, which in turn may have caused engine damage resulting in a premature shutdown.

## Double-Header Mission Gemini VII/VI Planned

Disappointment arising from the October 25 scrub of the Gemini VI mission when the Agena rendezvous Vehicle failed to orbit was tempered somewhat by an announcement later that week that a double-header mission of Gemini VI and Gemini VII was under serious consideration. Earliest launch date is December 4.

In a memorandum to President Johnson, NASA Administrator James Webb wrote, "If we can launch Gemini VII without serious damage to the launching pad there is some possibility that we could immediately re-erect the Gemini

VI spacecraft and booster and launch it in time to rendezvous with Gemini VII before the 14-day flight comes to an end."

In such a combined mission, the Gemini VII spacecraft would be launched into a 161-nautical mile circular orbit—the same as intended for the Agena rendezvous vehicle. Gemini VI would be launched about eight days later, depending on the time required to refurbish Launch Complex 19. Gemini VII, with flashing beacons and an L-Band transponder compatible with Gemini VI's rendezvous radar in the rendezvous and recovery section, would act as a target vehicle for Gemini VI. Rendezvous would be complete when the spacecraft were in close proximity of each other. No provisions have been made for docking the two spacecraft.

### MAIN OBJECTIVE 14 DAYS

Whether Gemini VI is launched while Gemini VII is still in orbit or not, the main objective of Gemini VII is a flight of up to 14 days duration.

Said Gemini Program Manager Charles W. Mathews: "The operation is not particularly different from a flight operations standpoint, in terms of trajectories, orbital mechanics and that type of thing, than we had planned for the Atlas-Agena. The Gemini VII spacecraft, of course, will be put into orbit on its fourteen day mission and there's really no constraint at all on the Gemini VII operation imposed by this mission — at least no major constraint—and none on the fourteen day duration."

"Regardless of what would happen in the progress of this plan," Mathews continued, "the Gemini VII operation would be carried out as planned currently."

In describing the joint mission, Gemini VI command pilot Wally Schirra said, "Our lift-off will be phased so that we will go on the same set of tables we anticipated with the Agena. Where we would anticipate effecting rendezvous on the fourth orbit, approximately some five hours and 30 minutes after our lift-off we should be in a position to dock on Spacecraft VII. Basically, the flight plan is identical to that point."

"Now to describe what we feel is rendezvous, I would best say that it would be like traveling cross country and putting your car in your garage and stopping there — that's rendezvous,"

Schirra continued. "Now, other definitions of rendezvous—what I would call passing acquaintances in this case—we will be that close to Spacecraft VII that it's merely a case of lacking the docking adapter to actually engage with the other spacecraft. That, of course, is very difficult and most improbable. You can't imagine having that type of hardware available for this short time we have left."

### WEAR LIGHTWEIGHT SUIT

Gemini VII command pilot Frank Borman, in describing the 14-day mission, said, "One of the things we have incorporated into this flight is a new lightweight suit. We plan to take this suit off in the flight and fly in a shirtsleeve environment for up to, we hope, 10 days."

When asked where in the spacecraft the lightweight suits would be stowed while doffed, Borman replied, "The suit rolls up very neatly into its own visor



GEMINI VII EMBLEM — A hand holding a flaming torch, flanked by a Gemini spacecraft silhouette and the Roman numeral VII, is the emblem of the Gemini VII mission.

and you can stow it in the footwell behind your legs. The way that we looked at in St. Louis in the altitude chamber was to use the seat belt and the leg straps and strap the suit right to the seat so that you end up sitting right on top of the suit."

Jim Lovell, Gemini VII pilot, added, "We plan to wait at least three days before we attempt this particular exercise just to

(Continued on Page 2)

## Coffee, Tea, Or Molotov Cocktail?

The passenger in Seat No. 21 reached into his pocket and pulled out his lighter to light a cigaret. As he spun the lighter's wheel, the lighter burst into flame. The astonished passenger flung the flaming lighter into the airplane's aisle. An alert hostess doused the fire with a glass of water from the plane's galley.

Aside from a scorched place on the aisle carpet, and some embarrassment for the passenger in Seat No. 21, there was little damage—this time. But it could have been different.

The passenger's cigaret lighter was the type that has a clear plastic fuel tank for visibility, but as the jet transport had climbed to cruising altitude, the reduced pressure had caused the lighter to leak fluid and become flooded. Instead of providing a

gentle flame, the lighter flared up like a miniature Molotov cocktail when Passenger No. 21 decided it was time for a cigaret. Such incidents have occurred several times aboard commercial aircraft.

It isn't cricket to knock someone's product, but it becomes obvious that the visible-tank lighters are *not* the type to carry while traveling by air.

## Faget, McDivitt, To Be Awarded Sword of Loyola

Maxime A. Faget, Assistant Director for Engineering and Development, and James A. McDivitt, Gemini IV command pilot, have been chosen to receive the 1965 Sword of Loyola award.

They will receive the awards at the Loyola University Stritch School of Medicine Annual Award Dinner in Chicago on November 23.

The Very Reverend James F. Maquire, S.J., president of Loyola University, said, "The 1965 Sword of Loyola is presented to these two distinguished Americans, for together they represent the intellectual achievement and the intrepid courage which is so critical to the success of America's current exploration of the universe. The Sword of Loyola will be presented to Astronaut McDivitt and Mr. Faget as representatives of the thousands of men and women who are participating in this magnificent program; the administrators, planners, scientists, engineers, technicians, and space explorers themselves."

## FBA Houston Chapter Meets At MSC Nov. 15

The Houston Area Chapter of the Federal Business Association, an organization of government employees, will meet November 15 at MSC.

William P. Kelley, Associate Director for Management, Office of Economic Opportunities, will be the principal speaker at the 7:30 p.m. session in the Bldg. 1 Auditorium. A dinner for the group will be held in the MSC Cafeteria at 4 p.m. for a cost of \$2 per person.

Neal Pickett of the Houston Office, Federal Housing Administration, is president of the Houston Chapter.

Phil Hamburger at Ext. 2765 has additional details on the Association and its activities.

## Medical Experiments

(Continued from page 1)

electrical activity of the heart to see if there is a difference in the time interval. We have found on the four and eight day flight no observable difference here; no delay or shortening of period between the electrical impulse and the mechanical contraction itself."

**M-5, Bioassays of Body Fluids** — involves "in-flight sampling of all the urine which is voided. It's a tritium system that puts a given amount of tritium into the 1200 cc urine bag, and a sample is transferred into a 75cc sample bag for storage and post-flight analysis."

**M-6, X-Ray Densitometry** — This experiment requires no active participation by the crew during the mission. Pre- and post-flight X-rays are made of the small finger and the heel bone of each crewman for obtaining data on total calcium balance within the body, and for determining if any demineralization has occurred during the mission.

**M-7, Calcium Balance Study** — "We have to know what calcium goes out in the sweat, we have to know what calcium goes out in the feces, what calcium goes out in the urine, have blood calcium levels with this, and we have to have a complete balance study—everything that goes in

and everything that goes out." A combination of controlled diet and analysis of body intake and output for the crew ten days prior to the flight will provide base-line data. The experiment will run during the mission itself, and then for a four-day post-flight period.

**M-8, In-Flight Sleep Analysis** — Electroencephalograph, or "brain wave," measurements will be made of the crew for four days during the mission to determine depth of sleep. Data will be stored in an on-board recorder for post-flight analysis.

**M-9, Vestibular Effects** — Experiment utilizes vision tester with bite-board for consistent alignment to determine changes in crewman's sense of orientation during prolonged weightlessness. Functions of the otolith (gravity gradient sensors in the inner ear) are measured through use of the vision tester.

One other Gemini medical experiment, M-2 Cardiovascular Effects of Spaceflight, is no longer considered an experiment, but has become a routine operational procedure wherein the crew is checked pre- and post-flight on tilt tables to determine any degradation in the heart's ability to compensate for return to 1-g environment after prolonged periods of weightlessness.

## Crews Named For Rendezvous-EVA Gemini IX Mission

Astronauts Elliott See and Charles Bassett were named this week as prime crew for the Gemini IX mission. Back-up crew is Thomas Stafford and Eugene Cernan.

The Gemini IX mission will



SEE

BASSETT



STAFFORD

CERNAN

include rendezvous with an Agena and extended EVA by pilot Bassett using a Manned Maneuvering Unit (MMU).

After docking, the Gemini/Agena may be maneuvered with the Agena's primary propulsion system. The Agena will be placed into a 200-mile circular orbit for possible use as a rendezvous vehicle for later Gemini missions. Micrometeoroid panels aboard the Agena will also be retrieved by crews of subsequent missions.

Gemini IX is scheduled for the third quarter of 1966.

## Classified Material Handling Controls Not Familiar To All

Not all MSC people are familiar with the proper ways of handling classified material, according to recent security surveys.

Classified material is controlled such that only those people having the appropriate clearance and a need-to-know have access to the material, and that it is transmitted and stored according to instructions. In addition, all Secret and certain categories of Confidential material require a signed receipt each time the material changes hands. These receipts are the responsibility of clerks in Custody Control Points set up throughout the Center, and all classified material must be routed through the Custody Control Clerks. The receipt system permits immediate inventory of classified material at any time.

All persons who deal with classified material should familiarize themselves with provisions of MSC Management Issuance No. 24-1-3, which spells out the whys and wherefors of classified material handling and mishandling. If that document does not throw light on the subject, call the Security Branch at 3331 and ask them to explain it all.

## Federal Merit Promotion Plan Selects Best Talent For Job

There is a saying that the best promotion program ever devised will be criticized by several employees for every one who lauds it—it will be a "good" program to the one who gets promoted and a "bad" one to those who are not selected.

The Federal Merit Promotion program is no exception. It has not resulted in more promotions nor guaranteed advancement for everyone; it has resulted in more employees being considered for promotion and helped to assure that selections are made on the basis of merit and fairness to all.

The purpose of the Federal Merit Promotion Program is not to reward workers for long and faithful service. Rather, it is to help management select the best talent in the ranks of the career service to meet the many challenging problems facing the Nation and to assure that selections are made on a fair and equitable basis.

Because of the size, complexity, and dispersion of the Federal work force the Civil Service Commission does not require agency promotion systems to be uniform. In fact, an agency may have several plans for different kinds of jobs and locations. One may require passing a written test while another may rely primarily on supervisory or group appraisals of employees being considered for promotion. Each agency has authority to establish the plan best suited to its needs—but the plan must incorporate certain merit principles and conform to CSC guidelines.

In addition to the requirement that promotions be made on the basis of merit from among the best qualified employees, promotion programs must provide for—

- Consultation—Agencies must have consulted employees in the development and installation of their promotion plans. Changes in plans are also subject to consultation.
- Information—Employees must

be informed of the policies and procedures governing their agency's promotion program. They must be able to find out readily how they are personally affected by their agency's plan, and how the promotion procedures are carried out.

- Consideration—Areas of consideration must be as broad as practicable and must be clearly defined and identify jobs that are covered.
- Qualifications — Plans must identify qualifications standards which will apply, and they must be applied systematically and uniformly to all candidates.
- Evaluation — Evaluation methods to be used in rating and ranking candidates must be reasonable, valid for the positions, and applied fairly and equitably.
- Nondiscrimination — Selections must be made without discrimination for any non-merit reason such as race, religion, sex, or politics.
- Complaints — Agency plans must provide for consideration of employee protests concerning failure to observe promotion guidelines and plans.
- Release—Employees selected for promotion must be released from the positions they occupy.

The current MSC Merit Promotion Plan has been in operation since September, 1962, and hundreds of promotions have been processed satisfactorily under its provisions. As the workforce has grown, however, it has become apparent that some aspects of the plan are in need of revision in order to make the program more responsive to the needs of management and to recognize more fully the career objectives of employees.

The MSC Promotion Plan is currently under review by the Personnel Division. Within the near future, proposed changes will be submitted to a representative sample of employees for comment.

## Gemini VII/VI

(Continued from page 1)

make sure the spacecraft settles down and we know all the little ins and outs of the spacecraft."

### IMPROVED STOWAGE

On-board stowage space for waste matter — empty food wrappers, body wastes and other accumulated garbage—for the 14-day Gemini VII flight has been relieved somewhat by provisions in the spacecraft for waste stowage behind the ejection seats and an additional waste bag in the environmental control system area beneath the seats.

"I think this is the major change that has made the storage of this experimental equipment — we don't call that 'waste' any more — that's experimental equipment to bring back for our medical experimenters," said backup command pilot Ed White. "We can put it all back behind either one of the two seats and it's taken all the pressure off our stowage. Those are basically the big changes. The

rest of the stowage is quite similar to previous spacecraft."



**LIGHTWEIGHT SUIT**—Suit Technician Fred Spross of Crew Systems Division models for newsmen the lightweight pressure suit now in qualification for possible use on the Gemini VII mission.

## HAD FACELIFTING—

## MSC's One-Ship 'Fleet' Supports Tests, Training

The Manned Spacecraft Center's "navy," a converted Army landing craft utility (LCU), recently underwent a face-lifting which included relocating the bridge to better adapt the vessel to perform its space-oriented duties.

NASA Motor Vessel Retriever, as the 115-foot long and 34-foot wide ship is called has been in use by the MSC Landing and Recovery Division since June 1963, in support of operational tests that require large and sometimes rough water areas.

These exercises have included Gemini postlanding water suitability tests, water egress training for flight crews, spacecraft drop tests from aircraft, spacecraft uprighting sea tests, Gemini and Apollo sea-dye tests, flotation collar tests, qualification of

tronic steering controls, the ship's wheel, gyro repeater compass, and the radar.

In addition to these controls, another set of air controlled clutches for the engines, along with another electric steering control have been installed to provide two crew stations so that the ship can be operated from either side of the bridge. Another portable electric steering control on an extension cord, which allows the ship operator to move about on the bridge, has also been installed.

The new bridge, which is more than twice as large as the old one also contains a ship-to-shore radio, radar, water depth recorder, wind velocity and wind direction indicators, a chart table, a magnetic compass, autopilot, and an additional gyro repeating compass.

Originally built for the Army in 1954, the Retriever was acquired by NASA in early 1963 at Ft. Eustis, Va. It was sailed by an army crew to Charleston, S.C., where its present skipper Frank M. Gammon, assumed control of the vessel for NASA, and the Army crew sailed the LCU on to New Orleans. It was then sailed to a Mobile, Ala. shipyard for modifications and was brought to Houston in June, where it was pressed into duty within a week.

One of the Retriever's first tests was performed in Galveston Bay with a group of local newsmen on board to witness the exercise. A boilerplate spacecraft was placed in the water and retrieved to demonstrate the ship's capabilities.

Presently a telemetry instrumentation station for the Apollo post-landing qualification program is in the process of being installed on the Retriever by the MSC Information Systems Division.

Equipment onboard for handling of spacecraft include a 10-ton lift capacity boom with a 50-foot mast and a 10 to 12-ton davit retrieval crane. Both the boom and the crane will swing



**DECK BRIEFING**—Participants in a water egress training exercise are briefed on the deck on the NASA Motor Vessel Retriever en route through Bolivar Roads to the training site in the Gulf of Mexico due south of Galveston. The Retriever's new wheel house has improved the vessel's operational efficiency.



**THE SKIPPER**

Frank M. Gammon

shipboard recovery equipment, and other qualification testing programs.

The old bridge has been replaced with a new elevated structure that contains all the controls from the old bridge plus some additional equipment. The new bridge is about two and one-half feet higher than the old one, and measures 20 by nine feet. It is enclosed all around by opening-type tinted glass windows, and the bridge area is heated and air conditioned for crew comfort.

Controls moved from the old bridge, include the air controlled clutches for the diesel engines which propel the ship, the elec-

over the side for retrieval of spacecraft from the water.

The retriever is manned by a permanent crew of three men who perform routine maintenance as time permits in the busy schedule of the vessel. The ship is utilized for MSC test and qualification exercises on an average of four working days each week. Major repairs such as the recent relocating of the bridge, or the once-a-year dry dock maintenance, is contracted out.

The shallow draft of the vessel, four and one-half feet, makes it ideal for working in the Galveston Bay area. The Retriever's large deck area provides adequate working space and a lift capability in excess of 20,000 pounds, which is sufficient to do all testing for Apollo and the extended Apollo programs. The LCU was originally designed to carry six 30-ton tanks or 200 battle-equipped soldiers. It has a 350-ton water displacement.

A limitation of the Retriever is its slow speed. A maximum speed of seven knots is provided by the three 165 hp diesel engines, and when the vessel is bucking a running tide, four knots is about all the speed that can be mustered. From the

Retriever's permanent berth at Seabrook Shipyard to Galveston takes an average of four hours. So, as a rule when tests are to be conducted in the Gulf, the vessel is docked at the Corps of Engineers' or Coast Guard Dock at the Galveston Coast Guard Station.

The crew: Gammon, ship's captain; Frank J. Janoch, chief engineer; and William C. Lyons, deck hand; are all members of the Operational Evaluation and Test Branch of the Landing and Recovery Division.

During tests, the crew of three receives assistance in the operation of winches, spacecraft



**MR. INSIDE AND MR. OUTSIDE**—Bill Johnson, left, operates the controls for the Retriever's main deck crane while Lyman Lee adjusts a sling on the crane's hook. Johnson and Lee are in the Field Test Branch, Technical Service Division.

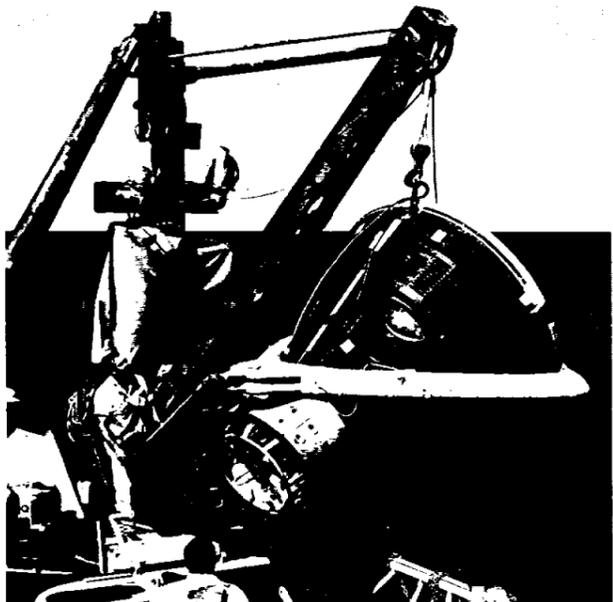
handling and shipboard duties from the Technical Services Division and others onboard to support the tests.

A complete galley and sleeping quarters for 17 people are onboard the Retriever. These facilities are utilized on tests that require more than one day to complete. The old bridge area was converted to bunk space to provide three of the 17 sleeping spaces.

Another recent addition to the Retriever is the davit retrieval crane which has interchangeable rings to accommodate either the Gemini or the Apollo spacecraft. During the remodeling of the vessel, provisions were made for mounting the crane on either the main or poop deck.

The new crane was first operationally used for the egress training of the Gemini VII backup crew in the Gulf of Mexico, on October 29.

The recent addition of the new bridge to the Retriever and other modifications were performed by Todd's Shipyards Corporation in Houston at a cost of about \$150,000. This was followed by the annual drydock maintenance which was performed by Bludworth Shipyard Incorporated, Brady Island.



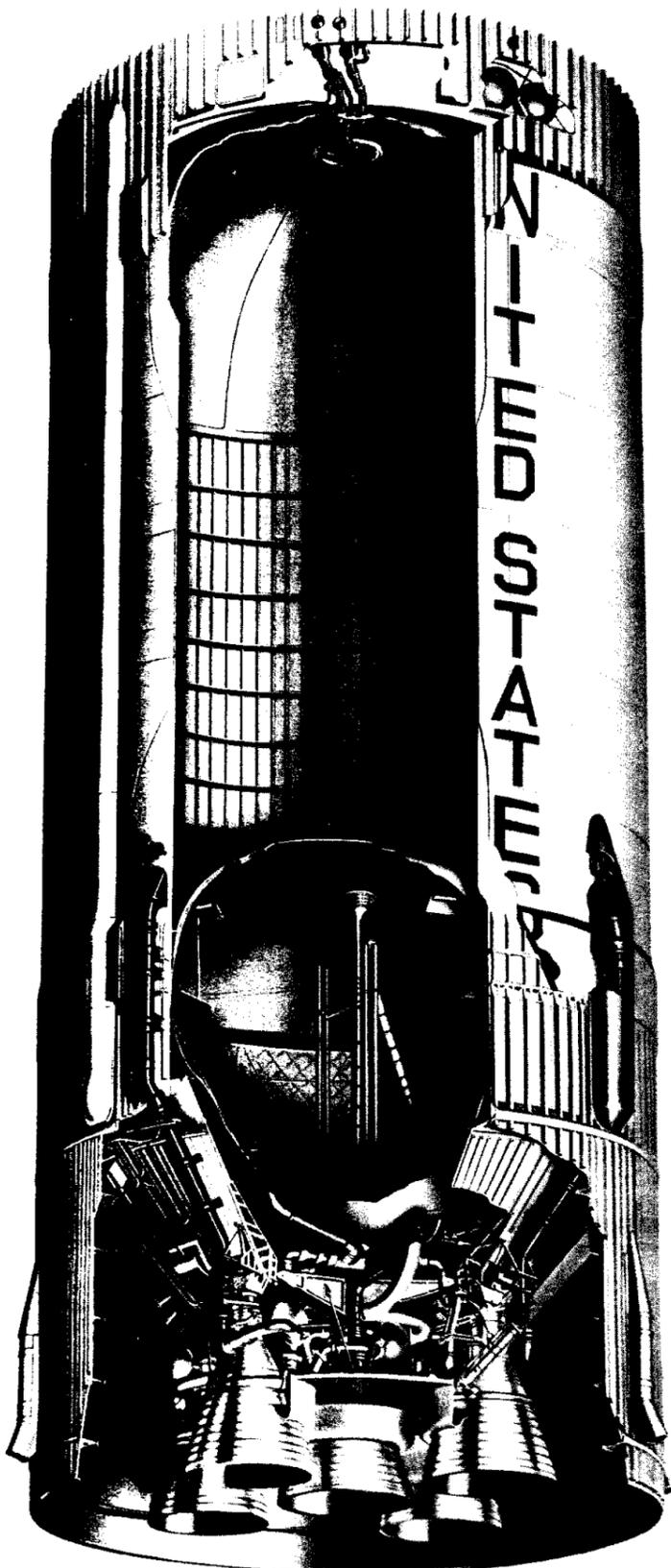
**NEW DECK CRANE**—Part of the Retriever's facelifting included installation of a new davit crane. Here Bill Johnson of Technical Services hauls Gemini Spacecraft Static-Article 5 inboard after an egress training session.



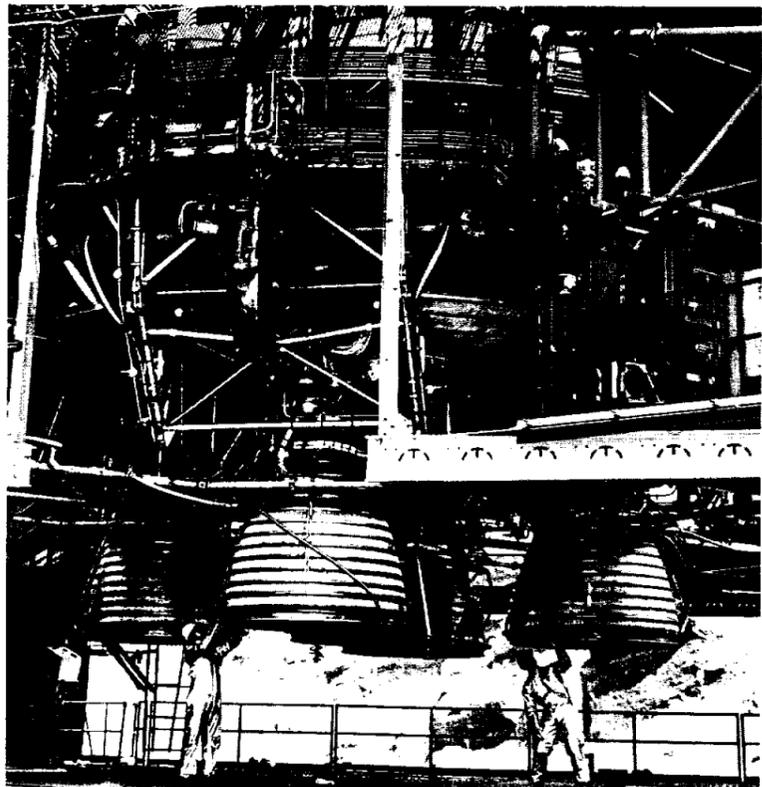
**CHECK GEAR**—Swimmers Lamarr Beatty, Jerry Fleming and Art Lizza, all of Field Test Branch, Technical Services Division, check their wet-suits and gear as Bill Johnson, left, and Weldon "Gus" McCown (in lifejacket) observe.



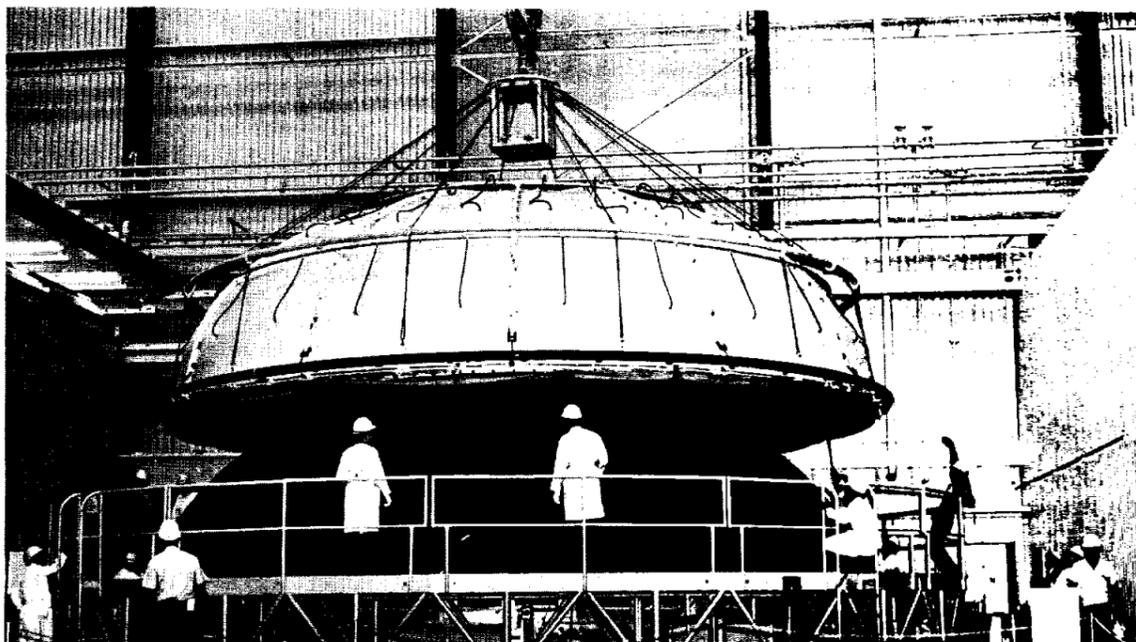
**HATCH-CLOSURE CHECK**—Gemini VII back-up crew Mike Collins, left, and Ed White prepare for hatch closure in a Gemini boilerplate spacecraft prior to their being hoisted over the side for an egress training session.



S-II CUTAWAY—Saturn S-II stage cutaway drawing shows interior of liquid oxygen tank, immediately above engines and thrust structure, and the liquid hydrogen tank. Five Rocketdyne J-2 engines with a total thrust of one million pounds power the stage.



PRE-FIRING CHECKS—Technicians at NAA's Santa Susana static test lab prepare a "battleship" S-II vehicle for hot firing. J-2 engines are regeneratively cooled through tubes running the length of engine nozzles.



FIT-CHECK—S-II stage forward bulkhead is lowered onto aft bulkhead for fit-check prior to going to the Seal Beach facility, where a 38-foot diameter by 20-foot high autoclave bonds and cures common bulkhead assemblies.

Developing one million pounds of thrust at altitude, the North American Aviation Space and Information Systems Division-built Saturn S-II is the most powerful liquid hydrogen stage under production.

The Space Division is developing the S-II for the NASA Marshall Space Flight Center, Huntsville, Ala. The more than \$300-million contract calls for the development of 10 live flight vehicles, and three ground test vehicles.

The division also is contractor to the Manned Spacecraft Center for the Apollo command and service modules.

The second stage of NASA's giant Saturn V, the S-II stands 82 feet tall and is 33 feet in diameter. It will play a vital role in boosting America's astronauts to the moon in the Apollo lunar landing program.

The S-II's part in the lunar mission begins after the Saturn V's first stage has boosted the three-man Apollo spacecraft

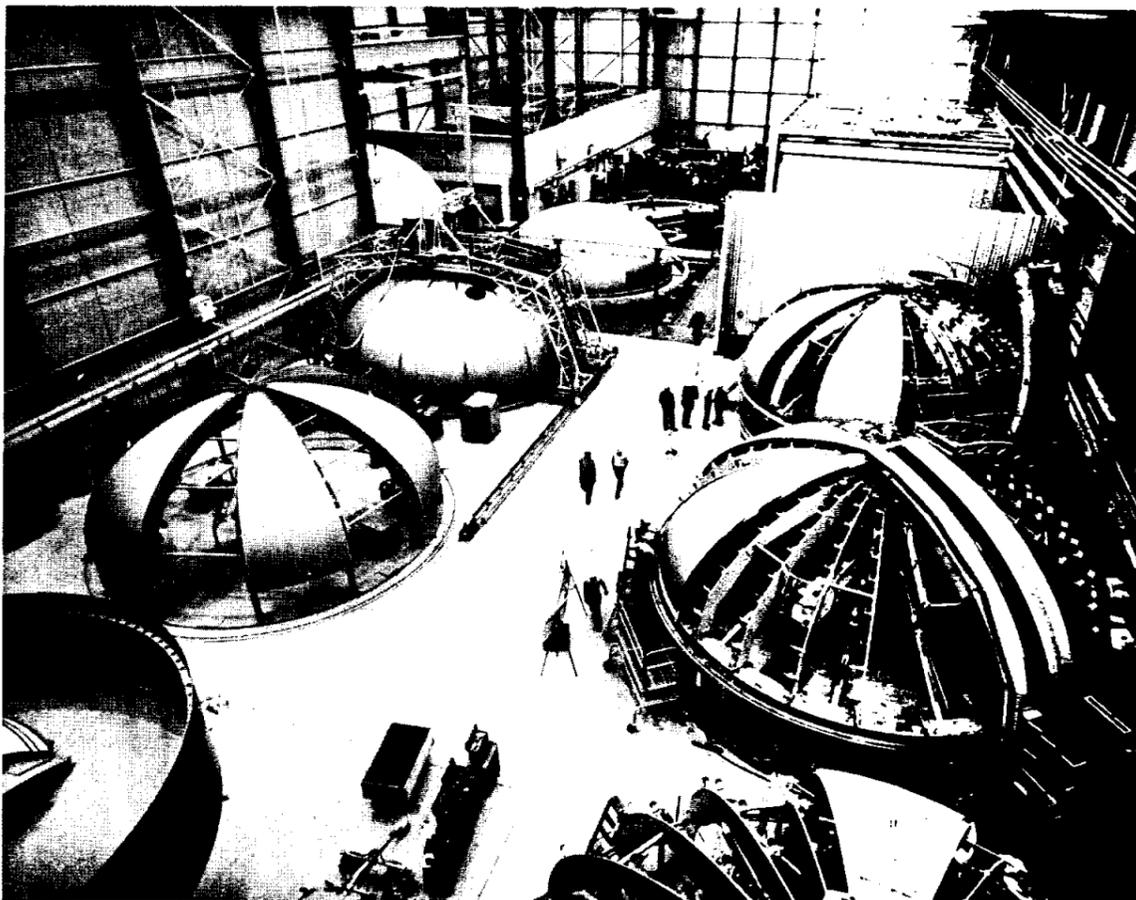
to an altitude of approximately 30 miles. The S-II's engines roar to life to provide the thrust to push the spacecraft to 100-mile orbital altitude.

Headquarters for the S-II program is located at the Space Division's Downey, Calif., plant. Assembly of the stage takes place at the nearby Seal Beach, Calif., facility, and engine testing is conducted at the Santa Susana Field Laboratory in Canoga Park, Calif.

**TEST VEHICLE SHIPPED**

A key milestone was achieved in the S-II program on October 1, 1965, when the Saturn S-II-T All Systems Test Vehicle left Seal Beach for a 4,000-mile shipboard journey through the Panama Canal to NASA's Mississippi Test Facility. The vehicle arrived at MTF October 17.

At Mississippi, the test program for the flight-weight S-II-T will include checkout of the MTF test stand, the first check of a flight-type stage with S-II



DOMES YARD—Assembly fixtures for welding propellant bulkhead segments into complete domes are shown in the NAA Downey plant. Two completed domes are at left rear.

# NAA's Saturn S-II Stage Most Powerful Hydrogen Powered Booster Now In Production

EDITOR'S NOTE: This is the sixth in a series of articles being presented to acquaint the employees of the Manned Spacecraft Center with the contractors who make the Saturn launch vehicles and related equipment that will be used in the Apollo program. The material on these two pages was furnished by Space and Information Systems Division, North American Aviation.

automatic checkout equipment, simulated S-1C and S-II interstage environmental testing, and the actual static firing of the stage to verify S-II design and test procedures.

## FULL DURATION FIRING

The S-II's J-2 engine powerplant has already passed several vital tests. A successful full-duration (6½-minute) cluster firing of all five engines took place on August 9, 1965, following several successful firings of shorter duration.

The S-II weighs 86,000 pounds empty and 1,025,000 pounds fully-loaded. It will hold 265,000 gallons of liquid hydrogen in its upper fuel tank and 81,500 gallons of liquid oxygen in its lower tank.

A vital common bulkhead, insulated with phenolic honeycomb, separates the two tanks to keep the minus 275 degrees F liquid oxygen from being frozen by the minus 423 degrees F liquid hydrogen. The bulkheads and cylindrical sides of the liquid hydrogen tank are insulated so thoroughly that the stage will be able to

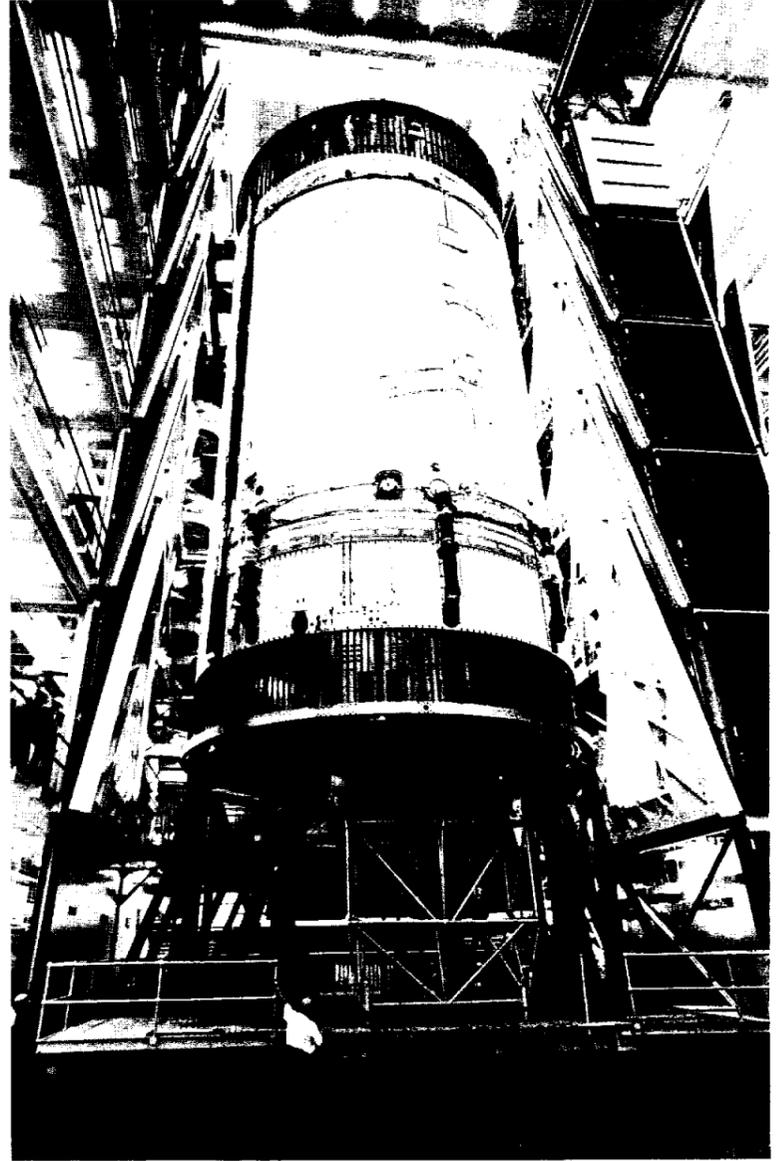
withstand a 12-hour hold on the launch pad.

From MTF, the stage will travel by barge to NASA's Kennedy Space Center, Florida, where it will be combined with other stages of the Saturn V, and then placed on the launch pad to await the countdown that will be a prelude to landing the first Americans on the moon.

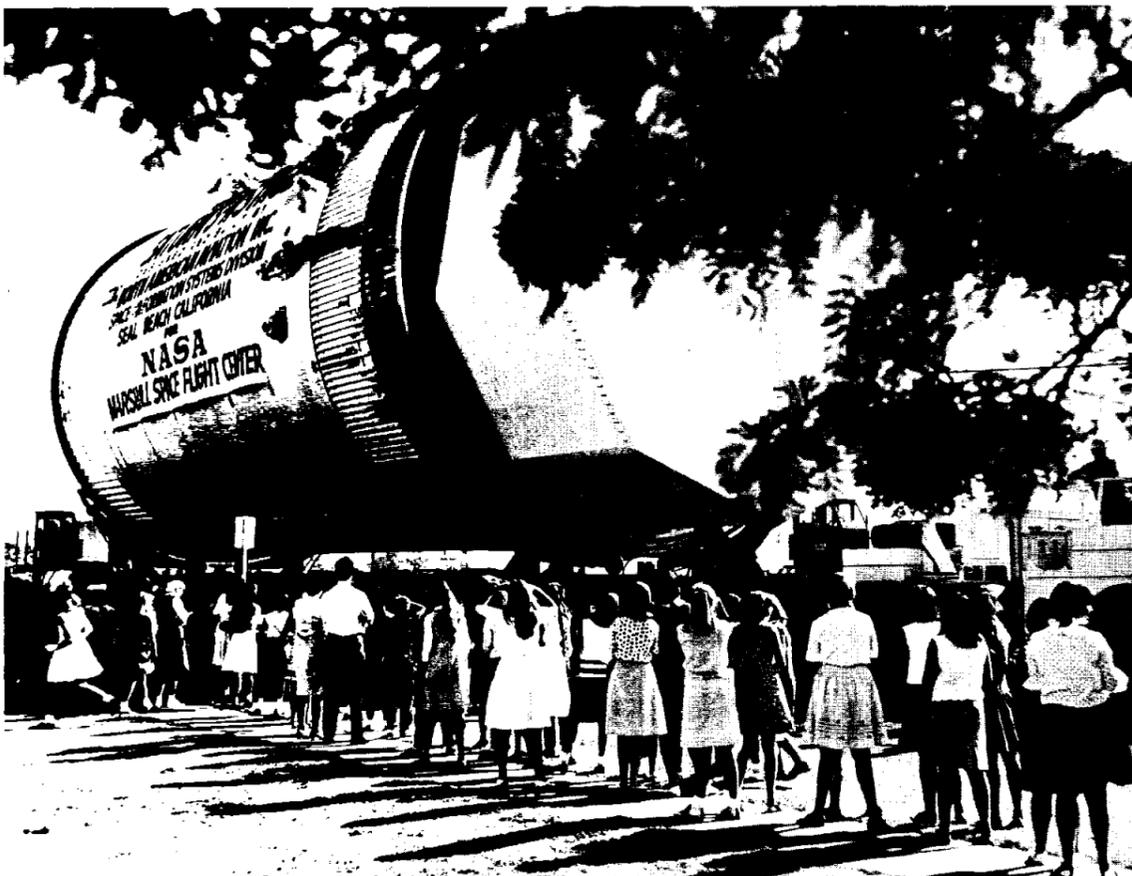
Headquarters for the Space Division and its 34,000 employees is Downey, Calif. The division has several facilities in the Downey area, and a plant at Tulsa, for both the Apollo and Saturn programs.

The division is North American's prime organization for manned and unmanned spacecraft and space systems, space boosters, information systems, and man-in-space programs and research work.

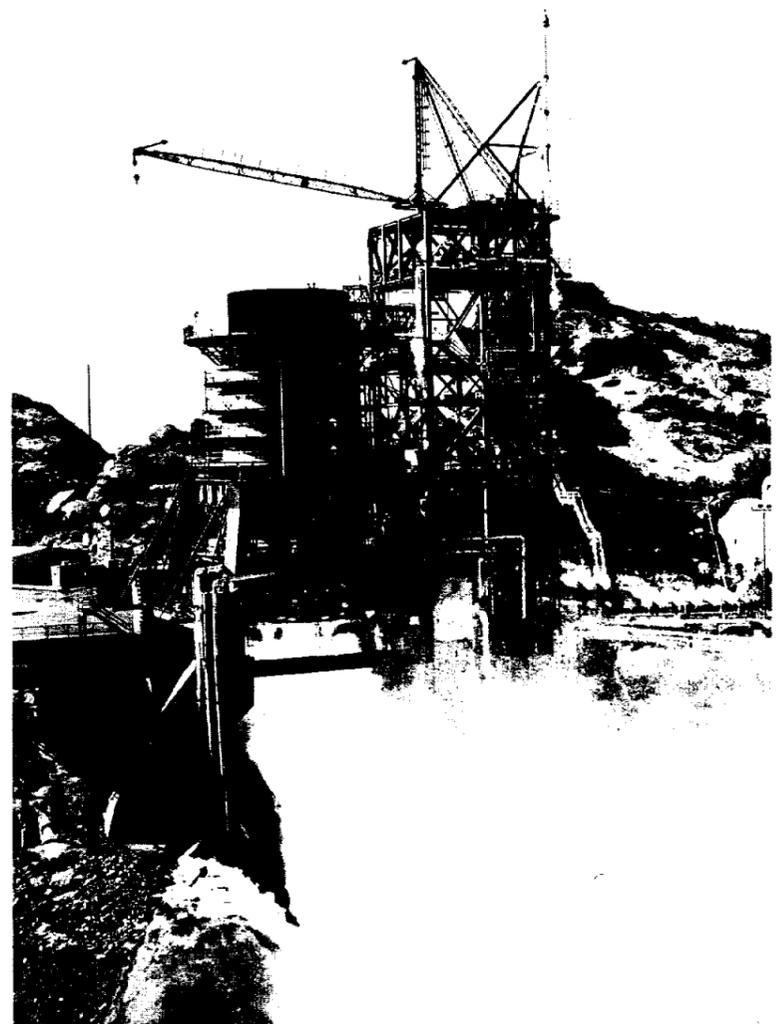
The S-II's journey to Cape Kennedy and its eventual launch into space will begin following final assembly at Seal Beach. All S-II stages will be transported to NASA's Mississippi Test Facility for final testing.



ROLL-OUT—A motorized transfer table at NAA's Seal Beach facility Vertical Assembly Building rolls out the first completed test model of the Saturn S-II stage. The stage is assembled vertically by the "building block" technique.



WIDE LOAD—Youngsters at McGaugh School in Seal Beach, Calif., watch a Saturn S-II-T stage as it passes along highway toward barge dock and the start of a 4000-mile sea voyage to the NASA Mississippi Test Facility for extensive ground testing.



INFERNO—The five J-2 liquid hydrogen-liquid oxygen engines are fired for full 400-second duration test at NAA's Santa Susana static test lab on a battleship S-II stage.

The SPACE NEWS ROUNDUP, an official publication of the Manned Spacecraft Center, National Aeronautics and Space Administration, Houston, Texas, is published for MSC personnel by the Public Affairs Office.

Director . . . . . Dr. Robert R. Gilruth  
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## On The Lighter Side



Have you heard about the Aggie who...

## Out Of Texas' Past . . .

(EDITOR'S NOTE: To acquaint MSC employees with the rich historical background of the Galveston Bay area, and of Texas in general, a series of historical articles prepared by the Historical and Library Services Branch will appear in the Roundup.)

Ask an average native of Harris County how many national presidential-nomination conventions have been held in his county. Chances are he'll say only one—the 1928 Democrat meet, at which FDR nominated "the happy warrior," Al Smith.

But the right answer is not one, but TWO. On April 21, 1860, 24th anniversary of the Battle of San Jacinto, a conclave of Texans met at the Battleground, just 12 miles north of MSC, and nominated a "people's candidate" for president of the United States.

If that candidate had been elected, the American Civil War might well have been averted.

John Manley, a Houston lawyer, chaired the convention. Dan Atchison, a Galveston lawyer, headed the resolutions committee. One resolution said: "We have fallen upon evil times. Political jobholders have invented new questions to distract the public mind. They have arrayed one section against another. They have sown discord where goodwill would have prevailed but for their wicked efforts."

Then the delegates nominated Governor Sam Houston for president. Houston bitterly denounced disunionists. He repeatedly and publicly predicted that secession, if it came, would lead to a war which the South would lose. He advocated calling a convention of Southern leaders to work out compromises with the North on all issues that were splitting the Union apart.

A Houston-for-president campaign poster said: "People of all parties look to the only man who has the ability and courage to

calm the troubled waters and arrest the fell spirits of disunion that threaten the destruction of the government. All men who love their country should unite on a common platform of reciprocal justice for the preservation of the Constitution and the perpetuity of the Union."

If the "people's candidate" had defeated Douglas, Breckenridge and Lincoln in November of 1860 he undoubtedly would have been a powerful force for peace. But if enough Northerners and Southerners had agreed with him to elect him president, then the nation would have been in no mood for secession and conflict.

Houston was still a hero and a talented political operator, but the compromise with which he hoped to prevent the War Between the States seemed out of character. In his personal dictionary, which may be seen at the San Jacinto Museum, he had inked out the words *temporize* and *temporizer* and had penned in the margin: "Out with it!"

Unfortunately, the aging hero got little support in the South. Southerners were disinclined to temporize too. Few of them sang Houston's campaign song: *The Union is our wagon, And it isn't any sham; For it's loaded with the people, And the driver's name is Sam!*

Texans not only stayed off Sam's Union bandwagon. They seceded from the United States, kicked Houston out of office and replaced him with Lieutenant Governor Edward Clark.

Houston declined the offer of Union soldiers to try to restore him to office. But he also declined to take the oath of allegiance to the Confederate States of America. He retired to his home in Huntsville, an unhappy old warrior, and died before the end of the tragic struggle that he had tried harder than most other Americans to prevent.

## Welcome Aboard

During the last reporting period 60 new employees joined the Manned Spacecraft Center.

**Center Medical Office:** Margaret Eastman, Johnnie S. Haylon, Clevia F. Starling.

**Public Affairs:** Martha E. Hall, Bernece M. Harris, Eileen Hillje, Karren K. Hollenbeck, Elizabeth A. Jezewski, Angie P. Romero, Martha H. Smith, Louise A. Snedden, Doris Soiland.

**Administrative Services:** Carl Lane, Dolores J. Martin, James Sims, Estelle A. Waddell.

**Procurement & Contracts:** Rita J. Darling, Nan C. Moore, Iris M. Rawlings.

**Engineering:** Jerry A. Jones.

**Personnel:** Jimmie T. Cain, Jane B. Peto, Albert J. Price.

**Resources Management:** Linda M. Baker, Judy F. Dement, Sherry D. Ellisor, Anva L. Green, Elizabeth J. Herrmann.

**Flight Crew Support:** Joyce E. Dalley, Catherine G. Gillis, Robert A. Howard, Doris H. Jernigan, Sondra F. Laberge, Maury L. Minette, Duane K. Mosel, Doris L. Roberts, Billie J. Saunders, Lynda R. Thomas, Willie M. Vordenbaum, Marion E. Wheeler.

**Guidance & Control:** John F. Hanaway.

**Asst. Dir. Flt. Opers:** Richard G. Beaudry.

**Flight Control:** Carroll E. Hopkins, Joyce E. Long, David R. Huckaby, David L. Walker, Robert J. Williams.

**Mission Png. & Analysis:** Ollis P. Reaves.

**Flight Support:** John F. Devietti, Robert Pittman, William J. Wetzel, Robert G. Wilfong.

**Gemini Spacecraft Program Office:** Elizabeth K. Hartman (Cape Kennedy, Fla.), Edward A. Foster.

**Apollo Spacecraft Program Office:** Jennie R. Bloom (Bethpage, New York), Chester E. Olesen (Downey, Calif.), Tamara L. Pruitt (Downey, Calif.).

**White Sands Test Facility:** Alec I. McKay, Barbara L. Murray.

**Landing and Recovery:** Reed M. Darley.

## SPACE QUOTES

Address to Building Products Executive Conference by Dr. Edward C. Welsh, Executive Secretary, National Aeronautics and Space Council; Washington, D.C. October 7, 1965:

"Progress in space comes from moving forward with daring and confidence. Those who fail to anticipate growth are not builders and do not belong in your industry or in any part of the space program. The true builder builds to the limit of his technology, learns more at that level, and then builds some more. The result is technological and economic growth."

## Space News Of Five Years Ago

Nov. 13, 1960 — Systems checkout tests were completed on Mercury Spacecraft No. 7. In the opinion of McDonnell, the results demonstrated that this spacecraft was adequate for a manned mission.

DOD announced that NASA, USAF, USA and USN were jointly building a geodetic satellite to map the earth accurately.

Nov. 16, 1960—A meeting was held at Langley Field by NASA personnel to discuss the results of test programs which had been conducted. Of particular interest was the establishment of the causes for the failure of the Mercury-Atlas 1 mission and to determine the status of readiness for the Mercury-Atlas 2 mission.

Nov. 17, 1960—The Space Task Group requested that McDonnell submit a proposal for conducting a test to determine the capability of an astronaut to make celestial observations through the Mercury spacecraft observation window.

Nov. 18, 1960 — Mercury Spacecraft No. 8 was delivered to Cape Canaveral for the Mercury-Atlas 3 unmanned orbital mission.

Nov. 21, 1960 — An attempt was made to launch Mercury-Redstone 1 from Cape Canaveral. This unmanned mission was unsuccessful because premature cut-off of the launch vehicle activated the emergency escape system when the vehicle was only about one inch off the pad. Engine cut-off was caused by premature loss of electrical ground power to the booster. The launch vehicle settled back on the pad with only slight damage. Since the spacecraft received a cut-off signal, the escape tower and recovery sequence was initiated. The undamaged spacecraft was recovered for reuse.

Nov. 23, 1960—In a letter to the chairman of the Senate Committee on Aeronautical and Space Sciences, NASA Administrator Glennan defined low-altitude (orbits of 2000 to 6000 miles) active communications satellite development to "stimulate those developments which promise early benefits to our citizens."

Nov. 25, 1960—NASA scientists increased the speed of spin of TIROS II by means of ground radio command.

## The Barleycorn Anachronism

Back in 1324 A.D., King Edward II of England passed a law that "three barleycorns, round and dry" make an inch. In that day and time, the accuracy of barleycorns was probably sufficient for craftsmen building oxen yokes or laying out battlements atop castle walls.

Now past the mid-point of the twentieth century, at least in the United States, we are stuck with the fourteenth-century English system of measurement, with awkward fractions of twelfths, eighths and sixteenths to cope with. The system of measuring weights and volumes—pounds, ounces and cubic feet/inches—is certainly not less ungainly.

The western world had rocked along with the barleycorn system until 1793, when the first system of weights and measures with a scientific basis was adopted by the French in which everything is in multiples of ten, all related to a unit of measure called the meter. The meter was derived from one ten-millionth part of the surface distance of a line running from the North Pole through Paris to the Equator. It seems logical that our planet is probably a more constant standard than a barleycorn.

### UNIFORM BASIS

Liquid measure, volume, acceleration, velocity and all other types of measurement are directly related to the meter—which inconsequentially is equal to 39.37 inches, or 118.11 barleycorns.

Conversion from millimeters to centimeters, from meters to kilometers, is accomplished by simply shoving a decimal point around a bit—no weird fractions like  $\frac{11}{64}$ ths,  $\frac{21}{32}$ nds, ad infinitum.

Advancing technology the world over has demanded closer tolerances and speedier calculations, and for these reasons most industrial countries have long since adopted the metric system, including Iron Curtain countries. Even England, originator of the barleycorn system, recently went onto the metric standard.

### SLOW TO CATCH ON

The United States is now the last major hold-out against the metric system, although some American industries have begun a gradual switch-over.

The meter is, in fact, the legal unit of measure of the United States. And while some scientific disciplines in this country do use the metric system exclusively, there is quite a bit of resistance to adopting the meter as a standard measure in day-to-day life—mostly an attitude of "what was good enough for Dad is good enough for me."

### GRADUAL CHANGE

Certainly no one is advocating an overnight switch to the metric system, for to do so would obsolete billions of dollars invested in industrial tooling. But a gradual change over a period of 10 or 15 years would allow replacement of foot-and-inch equipment with metric equipment as the older equipment wore out.

"But I can't get used to a foot being 30.48 centimeters," argue some opponents of adoption of the metric system.

How many centimeters are in a foot, or how many inches are in a meter is irrelevant; one must learn to think metric and forget altogether the conversion from one system to another.

The feet-and-inches system is an anachronism in our technological society, but then some people would rather fight than switch.

# Space News ROUNDUP!

MANNED SPACECRAFT CENTER, HOUSTON, TEXAS

## EMPLOYEE NEWS

### For Freeman Library



**LIBRARY FUND**—Proceeds of the MSC VARIETY SHOW "Vaudeville Revisited '65" (See July 9 and 23 Roundups) are presented to Richard Allen, Chairman of the Board of Trustees of the Theodore Freeman Memorial Library by EAA President Phil Hamburger, left, and EAA Center Activities Chairman Mary Slyvia.

### TURTLE SHELLS TO FIBERGLASS—

## Hard Hats In Hazard Areas Can Prevent Dented Skulls

Somewhere back in the days of primeval man, when the name of the game was survival and avoiding being lunch for a tyrannosaurus or a saber-tooth tiger, a Cro-Magnon citizen whose brain was a little less dim than that of his cavemates pulled a turtle shell down over his skull to ward off falling lava or rocks

## Parschall Winner In Bridge Series

Bud Parschall captured the trophy for the EAA-MSC Duplicate Bridge Club series which ended Oct. 26. Charlie Brown was second and Mrs. Esther Wake third.

The October 5 Club Master Point winners were: North-South, Mr. and Mrs. Robert Wake, first; Robert Bliesner and G. Alger, second. East-West: Sara and William Stewart, first; S. Dalton and A. Verner, second. Winners of the November 2 Master Point were: North-South: L. E. Mercier and T. K. Sulsmeister, first; Bob Hodgson and Lee Pearson, second. East-West: Bill Hamby and Floyd Bennett, first; Emer St. Leger and Henry Rotter, second.

Several Club members placed well in the Sectional Tournament held in Galveston the weekend of October 29. Charlie Brown and Bud Parschall were second overall in the Open Pair Championships. Section tops in the Opens were also won by Bob Hodgson and Lee Pearson and Ray Lynch and John Gordon. Pearson, Hodgson, Brown and Parschall also participated in the Team Championships and tied for fifth/sixth overall.

heaved by other tribes.

Thus was born the hard hat. Nowadays there are not too many turtle-shell hard hats around; most of them are made of steel, aluminum or fiberglass. Plastic dielectric hard hats for working on electrical circuits, light plastic bump-caps for working among low beams and pipes, and heavy steel hard hats for working where heavy missiles are likely to fall from overhead—all of these are variations of the original hard hat.

Painting a dielectric hard hat with jazzy colors can break down the electrical resistance of the hat and make it unsafe, and some types of plastic or fiberglass hats are softened by painting, thereby weakening them. A hard hat's suspension band is its shock absorber, and should be adjusted so that there is a minimum of 1/4 inches space between the top of the head and the hat. The headband should also be snug enough to prevent the hat from falling off when bending over.

Rugged as they are, hard hats are not made for throwing, dropping or sitting on, and abrasions, scrapes and nicks can seriously reduce the strength of a hard hat.

Most MSC people are fairly safety conscious; they seldom have to be reminded to wear a hard hat in a posted area. But then, there are others . . .

A dented, skinned or creased hard hat can be turned in and exchanged for another hard hat, but as yet our technology has not developed a replacement human head.

Wear hard hats in hard hat areas, okay?

## Federal Employee Salary Rates

Grade	1	2	3	4	5	6	7	8	9	10
GS-1	\$ 3,507	\$ 3,626	\$ 3,745	\$ 3,864	\$ 3,983	\$ 4,102	\$ 4,221	\$ 4,340	\$ 4,459	\$ 4,578
GS-2	3,814	3,943	4,072	4,201	4,330	4,459	4,588	4,717	4,846	4,975
GS-3	4,149	4,289	4,429	4,569	4,709	4,849	4,989	5,129	5,269	5,409
GS-4	4,641	4,797	4,953	5,109	5,265	5,421	5,577	5,733	5,889	6,045
GS-5	5,181	5,352	5,523	5,694	5,865	6,036	6,207	6,378	6,549	6,720
GS-6	5,702	5,894	6,086	6,278	6,470	6,662	6,854	7,046	7,238	7,430
GS-7	6,269	6,476	6,683	6,890	7,097	7,304	7,511	7,718	7,925	8,132
GS-8	6,869	7,097	7,325	7,553	7,781	8,009	8,237	8,465	8,693	8,921
GS-9	7,479	7,733	7,987	8,241	8,495	8,749	9,003	9,257	9,511	9,765
GS-10	8,184	8,464	8,744	9,024	9,304	9,584	9,864	10,144	10,424	10,704
GS-11	8,961	9,267	9,573	9,879	10,185	10,491	10,797	11,103	11,409	11,715
GS-12	10,619	10,987	11,355	11,723	12,091	12,459	12,827	13,195	13,563	13,931
GS-13	12,510	12,945	13,380	13,815	14,250	14,685	15,120	15,555	15,990	16,425
GS-14	14,680	15,188	15,696	16,204	16,712	17,220	17,728	18,236	18,744	19,252
GS-15	17,055	17,645	18,235	18,825	19,415	20,005	20,595	21,185	21,775	22,365
GS-16	19,619	20,297	20,975	21,653	22,331	23,009	23,687	24,365	25,043	
GS-17	22,217	22,994	23,771	24,548	25,325					
GS-18	25,382									

## MSC BOWLING ROUNDUP

### MSC COUPLES LEAGUE

Standings as of November 1

TEAM	WON	LOST
Bowlernauts	23	13
Four Friends	22 1/2	13 1/2
Igdits	22	14
Almosts	22	14
Intimidators	21	15
Spastics	20 1/2	15 1/2
LBD	17	19
Sociables	16	20
Eight Balls	16	20
Aces	15	21
Fire Balls	12	24
Fabulous Four	9	27

High Game Women: Betty Durkee 222, Shirley Yeater 209.

High Game Men: Ron Durkee 245, Joe Garino 237.

High Series Women: Shirley Yeater 571, Betty Durkee 542.

High Series Men: Joe Garino 629, Dan Kennedy 626.

### MIMOSA MEN'S LEAGUE

Standings as of October 28

TEAM	WON	LOST
Whirlwinds	23	5
Chizzlers	20	8
Alley Oops	16	12
Technics	15	13
Goobers	12	16
Green Giants	12	16
Road Runners	11	17
Foul Five	10	18
Agitators	6	22

High Game: B. Graham 273, G. Amason 266.

High Series: G. Amason 701, B. Graham 690.

High Team Game: Alley Oops 1105, Road Runners 1103.

High Team Series: Chizzlers 3138, Alley Oops 3085.

### MSC 5 O'CLOCK MONDAY MIXED LEAGUE

Standings as of November 1

TEAM/Captain	WON	LOST
1-Kutalek	14	6
4-Williams	12	8
5-McIver	12	8
3-Waters	8	12
6-Blank	7	13
2-Toole	7	13

High Game: H. Erickson 213, J. McIver 205.

High Series: H. Erickson 572, J. McIver 559.

High Team Game: Team 6—649, Team 2—596.

High Team Series: Team 2—1763, Team 1—1750.

## Income 'Insured' During Illness By Conserving Sick Leave

The advantage to MSC employees of conserving their accumulated sick leave for real emergencies was pointed out recently by Floyd D. Brandon, chief, Personnel Division.

He said, "The average Federal employee could not afford to buy sickness and accident insurance that will pay his full salary, say, at age 50, for a year and a half regardless of the type of illness or disability.

"As a person gets older," he continued, "extended illness is more likely to strike. Used con-

servatively, sick leave 'insurance' provides benefits an employee would not have."

All employees earn sick leave at the rate of 13 days per year and there is no maximum accumulation. In 20 years service a total of 2,080 hours or 260 days of sick leave is earned. This is the equivalent of a full years' pay.

Brandon went on to say, "The legitimate use of sick leave is wise and encouraged. If you are fortunate, however, and can save sick leave and permit it to accumulate, your benefits mount and one day, perhaps when you least expect, your sick leave 'insurance' may prove to be a valuable asset."

## Plan Christmas Dance A Sylvan Beach Dec. 10

Dancing by starlight in the cool breezes from Galveston Bay will highlight this year's MSC Christmas Dance at the Sylvan Beach Pavillion in La-Porte.

Scheduled from 8 p.m. to midnight on December 10, the dance will have music by Phil Gray and his orchestra.

Dance Chairman Rex Bauerlein says that there will be 700 tickets available to the semi-formal dance at \$2.50 per person, including set-ups.

## EAA Paragraphs . . .

The 1965-1966 MSC/Ellington AFB Men's Basketball League will hold its first meeting Wednesday November 17 at 7 p.m. in the Ellington AFB NCO Club.

Dick Wieland, Ext. 3021, is the contact for informal language classes to be formed after the first of the year, depending upon interest and demand.

## MSC/EAFB Flag Football League

Standings thru November 3

TEAM	WON	LOST
1. 2103 Communications Squadron	6	1
2. IESD	5	1
3. Lockheed Electronics (Tie)	5	2
3. General Electric (Tie)	5	2
5. Guidance & Control	3	2
6. ISD	2	5
7. 747th AC & W Squadron	1	4
8. Structures & Mechanics	1	6
9. ASPO	0	5

Scores for games played from October 19 thru November 3.

General Electric 18, Structures & Mechanics 0

747th AC&W Squadron 8, ISD 0

Guidance & Control 18, Lockheed Electronics 0

IESD 6, 2103 Communications Squadron 0

ISD 12, ASPO 2

Lockheed Electronics 12, General Electric 6

2103 Communications Squadron 32, ASPO 0

Lockheed Electronics 15, ISD 0

Lockheed Electronics 17, IESD 13

Guidance & Control 19, Structures & Mechanics 0

ISD 13, Structures & Mechanics 7

IESD 38, ASPO 0

\*General Electric 0, Guidance & Control 0

2103 Communications Squadron 8, 747th AC&W Squadron 7

2103 Communication Squadron 19, Structures & Mechanics 14

General Electric 13, ISD 0

Lockheed Electronics 19, 747th AC&W Squadron 0

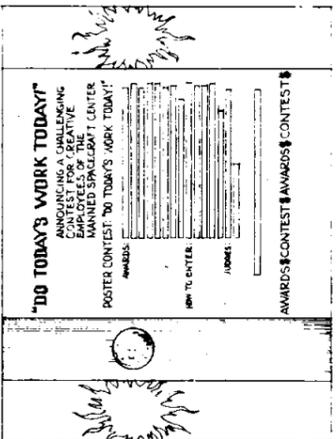
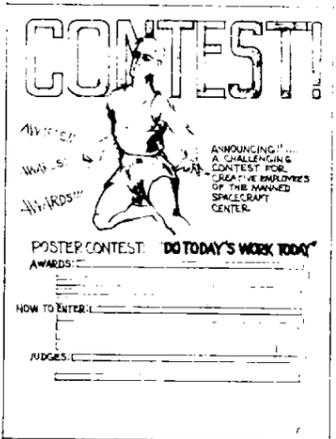
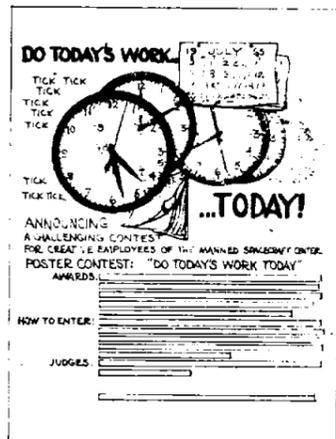
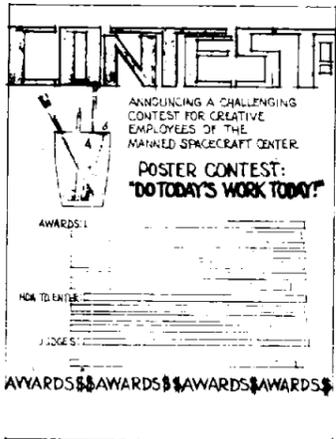
IESD 19, Structures & Mechanics 4

IESD 13, General Electric 7

2103 Communication Squadron 13, Lockheed Electronics 0

\*Won by Total yardage

Space News **ROUNDUP!**  
SECOND FRONT PAGE



**Cash Award Poster Contest Takes Aim At Procrastination**

An employee poster contest with the theme of "Do Today's Work Today!" instead of manana has been announced and is open to all MSC employees of Grade GS-15 and below.

Poster entries with the most original and effective approach to the meaning of "Do Today's Work Today!" will be judged by members of the senior staff for a first place cash award of \$100, second place \$50, and third place \$25.

Posters submitted in the contest may be on cardboard, poster board or ordinary paper, and maybe done in pencil, pen-and-

ink, tempera, collage, crayon or any other type poster media. The posters may not be larger than 24 by 30 inches.

The poster layouts above were prepared by Graphic Services to help inspire would-be entrants in the poster contest.

Submit posters, accompanied by a separate sheet with the entrant's name, office code and telephone number, to the Educational Programs and Services Branch, Public Affair Office, Code AP4, Room 155, Bldg. 1.

Contest deadline is 4:30 p.m., December 15, 1965.



**BADGE EARNERS**—Boy Scouts earning the new Space Exploration Merit Badge are shown at the presentation ceremonies with astronauts Ed White and James McDivitt. Front row, left to right, are: Robert Volz, Texas; Garland Novosad, Texas; White, McDivitt; William McDonnell, Missouri; Mitchell Turner, Illinois, and Jeffrey Sachau, New York. Back row; Timothy Chang, California; Brad Clardy, Texas; Bobby Baines, Texas; Dan Gower, Texas; Douglas Graham, Oklahoma; Ernest Perez, Texas; Steven Kwart, Louisiana, and Stanley Ott, Virginia.

**Technical Library Recataloging Books**

The MSC Technical Library is recalling all books charged out under the Dewey Decimal Classification Scheme so that they may be reclassified under the Library of Congress Classification System. The decision in 1963 to change to the Library of Congress Classification System was based on the greater flexibility of this Scheme, and the greater depth of classification allowed.

All books purchased by the Library after May, 1963 have been cataloged under the Library of Congress System, and all circulating copies of Library books are now under this classification. What remains to be done is the reclassification of all books charged out on an indefinite or permanent loan basis which have not been converted to the Library of Congress Scheme.

The Library is only sending recall notices to a limited number of borrowers each day. The Library requests that all borrowers of permanent loan materials return their books when notified.

**Hold Ladies' Golf Clinic**

A four-lesson golf clinic for the ladies—MSC women employees and wives of employees—will be held during November at the Ellington AFB golf course. Course golf pro Jim Owens will teach the beginner's course on how to dig small divots and how to drive down the fairway instead of hooking or slicing into the rough.

The classes will meet four consecutive Tuesdays—November 16, 23, 30 and December 7, with time choices of 9, 10 and 11 a.m. each day. The cost of four lessons is \$1. Owens' number is HU 7-1400, Ext. 496.

**AT MSC CEREMONY—**

**New Space Merit Badge Earned By 13 Boy Scouts**

Thirteen Boy Scouts, among the first recipients of the new Boy Scout Space Exploration Merit Badge, were presented their badges in a ceremony November 1 at the Gemini News Center. Former Boy Scouts Ed White and Jim McDivitt made the presentations.

Center Director Dr. Robert R. Gilruth presented the actual Boy Scout Space Exploration Merit Badge carried by Ed White during Gemini IV and his EVA to Chief Scout Executive Joseph A. Brunton, Jr.

To earn the new Space Exploration Merit Badge, a Scout must prepare several papers and talks on space flight and conduct several demonstrations related to space sciences.

NASA Headquarters worked with the Boy Scouts of America in developing the requirements for the Badge.



**FLIGHT-TESTED BADGE**—MSC Director Dr. Robert Gilruth points to the Boy Scout Space Exploration Merit Badge carried in the pressure suit pocket of Astronaut Ed White during the Gemini IV mission. Dr. Gilruth presented the badge to the chief executive of the Boy Scouts, Joseph A. Brunton, Jr.



**ROSEMARY AND FRIENDS**—Rosemary Clooney and Jose Ferrer were recent visitors to MSC. Here they are shown with the crew of Gemini V, Gordon Cooper and Charles "Pete" Conrad.



**SERVICE AWARD**—E. Clark Rouze, White Sands Test Facility Program Control Office, right, receives a 15-year Service Award from L. R. Gomez.